

however, slowly acted on by caustic potash, and seem to be of the nature of protein.

It will be observed that the most remarkable part of the phenomenon is that the granules are only formed in some of the external cells, and that these cells are, before the treatment with ammonia, indistinguishable in shape or by their contents from their fellows, which are unaffected by the solution.

There is, however, a curious functional difference between the two classes of cells, namely, that the granular cells do not produce root-hairs, which arise exclusively from the cells of the light-coloured rows. With this fact may be compared an observation of Pfeffer's, that the root-hairs of the gemmæ of *Marchantia* grow only from certain definite cells. He describes a similar state of things in *Hydrocharis*, but with these exceptions it seems not to have been hitherto suspected that root-hairs arose from cells in any way specialised.

In connection with this fact, the theory suggests itself that the light-coloured cells have been emptied in consequence of the granules having been used up in the development of the root-hairs. But this view is not compatible with the fact that light-coloured cells may often be found which have not produced root-hairs. Again, in the case of *Cyclamen*, root-hairs are produced from granular cells. Effects similar to those now described were observed in some other Euphorbiaceous plants, e.g. *Phyllanthus compressus*, though not in all the genera of this family which were observed. Among genera belonging to other families may be mentioned *Drosophyllum* and *Cyclamen*, as showing the phenomenon especially well. Altogether 49 genera were observed; of these 15 were conspicuously acted on, and 11 in a slight degree, making together 26 genera, while the roots of the remaining 23 genera were not acted on in any plain manner.

Before attempting to draw any conclusions, a few more details must be taken into account. The root must be alive, otherwise no precipitation will take place; the process is therefore a vital one, and seems in some measure to resemble "aggregation," as it occurs in the tentacles of *Drosera*. In both cases carbonate of ammonia is the most efficient re-agent, but other salts, such as nitrate of ammonia, produce a similar effect. What the nature of the process may be, must remain doubtful. The view here suggested is that the granular matter is of the nature of an excretion; the arrangement of the dark-coloured cells in rows agrees with what we know of the disposition of certain cells whose function is admittedly to contain excretions. The granules are, moreover, deposited in the loose exfoliating cells of the root-cap where they cannot take part in the life of the root; and this fact points in the same direction.

2. *On the Action of Carbonate of Ammonia on Chlorophyll Bodies.*—The effects of solutions of carbonate of ammonia and of other fluids on the tentacles of *Drosera*, &c., was described in "Insectivorous Plants," under the name of "aggregation." This process consists essentially in the appearance of curiously-shaped masses, of an albuminoid nature, which undergo striking changes of form. The masses were believed to be protoplasmic, but this conclusion has not been generally accepted, and has been called in question by such authorities as Cohn and Pfeffer. The present paper is intended to show that carbonate of ammonia causes a kind of aggregation in chlorophyll bodies; and as these are undoubtedly protoplasmic, the belief in the protoplasmic nature of the aggregated masses in *Drosera*, and other carnivorous plants, is supported.

The changes which occur in the chlorophyll bodies may be well observed in the case of *Dionæa*. If a young leaf is immersed for twenty-four hours in a solution of carbonate of ammonia (7 to 1000), and is then examined by making thin sections, the contrast with a normal leaf will be found strikingly great. In most of the cells, not a

single chlorophyll-grain can be seen, but in their place are found masses of translucent yellowish-green matter of diversified shapes, resembling in a general way the aggregated masses in the tentacles of *Drosera*. The matter is not exclusively derived from the chlorophyll-grains, but consists, in part, of matter deposited from the cell-sap, which is often the first to be formed, and is afterwards surrounded by the green matter derived from the chlorophyll-grains.

The same process may be observed in *Drosera*, and here it is not necessary to make sections, as the chlorophyll-grains may be well seen at the bases of the tentacles. Many observations were made in this way, and also by means of sections. In the case of *Drosera* it was possible to show that the chlorophyll-grains may recover from the effects of the carbonate—and this is a fact of some importance. After placing drops of various solutions on the discs of leaves still attached to their plants, green spheres or green zones surrounding a central purple mass were to be found in the tentacles. In this case it will be seen that the chlorophyll grains join with the purple cell-contents in forming aggregated masses. These masses were observed to be in constant slow movement. The leaves were then syringed with water and left to themselves for some days. When again examined, the green spheres had in large part disappeared, and instead of them normal chlorophyll-grains were found.

Other observations were made on *Drosophyllum*, *Sarracenia*, *Primula sinensis*, *Dipsacus*, *Pelargonium*, *Cyclamen*, and many other genera, with various results. In some cases the chlorophyll-grains disappeared, and the green masses were formed, in other cases hardly any effect was produced; in others again the chlorophyll-grains became confluent and formed curious horse-shoe like masses in the bottoms of the cells.

In the case of *Spirogyra* the effects of the carbonate were well marked, the spiral chlorophyll body breaking up into variously formed rounded and pear-shaped masses, which slowly changed their outline. Here also plainly-marked deposition of fine granular matter from the cell-sap was caused by the ammonia solution.

Finally, it may be pointed out that whether or not the argument from the facts here given in favour of the protoplasmic nature of the aggregates in *Drosera* be considered valid, the observations themselves possess some independent interest.

## NOTES

IN the New Code it is satisfactory to find that science is placed on a fair footing. While in elementary schools, the substratum of instruction, in the form of "obligatory subjects," is reading, writing, and arithmetic, still the grants for optional subjects are such as to encourage teachers to make them a regular part of education. In the class-subjects for older scholars, for example, we find geography and elementary science, and these it is recommended, should be illustrated as far as possible, by maps, diagrams, specimens, and simple experiments. In geography the subjects for the different standards are carefully graduated; in Standard V., for example, such subjects as latitude and longitude, day and night, and the seasons, are set down; under Standard VI., among other subjects, are the "circumstances which determine climate;" and under Standard VII., "the ocean, currents, and tides, general arrangement of the planetary system, the phases of the moon." Under Elementary Science, again, the object of the instruction is stated to be the cultivation of "habits of exact observation, statement, and reasoning." For the first standards, lessons in "common objects, such as familiar animals, plants, and substances employed in ordinary life," are to be given. For Standard IV, there is required "a more advanced knowledge of special groups of common objects, such as (a) animals or plants, with particu-

lar reference to agriculture; (*b*) substances employed in arts and manufactures; (*c*) the simpler kinds of physical and mechanical appliances, *e.g.* the thermometer, barometer, lever, pulley, wheel and axle, spirit-level." For Standard V. we have "(*a*) animal and plant life; (*b*) the chemical and physical principles involved in one of the chief industries of England; (*c*) the physical and mechanical principles involved in the construction of the commoner instruments, and of the simpler forms of industrial machinery." For Standards VI. and VII. the preceding subjects are set down "in fuller detail." If two class subjects are taken, the second must be, in the lower division, either geography or elementary science; in the upper division, history is added. Grants are also to be given for specific subjects, and in the schedule setting forth the subjects, the instruction is divided into three stages, and includes such subjects as animal physiology, botany, principles of agriculture, chemistry, physics (in two divisions—sound, light and heat, and magnetism and electricity). The syllabus under the various subjects has evidently been carefully considered, so as to give the pupil a fair knowledge of leading facts and principles. It is evident that the New Code, so far as science is concerned, is a great advance on the previous one; science has at last something like fair play, and the next stage will doubtless be to include its elements among the obligatory subjects. There is now, at all events, a real stimulus given to teachers to encourage the pupils to take it up, and every precaution has evidently been taken to stamp out mere learning by rote, and to secure that what science is taught shall be real.

THE first report of the Royal Commissioners on Technical Education has been issued. It states that the Commissioners have conducted their inquiry into the instruction of the industrial classes under the following heads:—The instruction of the proprietors and superior managers engaged in industrial pursuits; that of the foremen, and that of the workmen. During their recent visits to France and the north of Italy, they have collected data bearing on each of those heads, but they consider it is not desirable to publish the whole of the information thus obtained, until they have possession of the corresponding facts about other countries, including the United Kingdom. To publish the information at present without comment, would involve great risk of its not being properly understood, and the Commissioners are not yet themselves sufficiently informed to be able, in all cases, to present trustworthy conclusions. At the same time, they think it desirable to make known, without unnecessary delay, certain very recent changes in the French laws on public instruction, as well as the purport of others still under consideration. These changes are affecting, and will further affect, the ordinary and higher elementary instruction, both literary and technical, of the workmen and foremen in France. With the object of showing their influence upon the former class, an account is given of the present and recent position of various branches of instruction in that country. The report proceeds to give voluminous details respecting the systems pursued in French elementary schools and training colleges. Information is also given respecting adult art schools, shelter schools, State grants for technical instruction, and the outlay of French municipalities for local technical education. These points are dwelt upon as illustrating the activity in France in all that relates to the instruction of artisans. In concluding their report, the Commissioners state that they wish it to be distinctly understood that they have not made any recommendation for the improvement of the instruction of our own artisans beyond the introduction of manual work in some of the elementary schools. They have refrained at present from further recommendations, not because they are not fully alive to the need of greatly improving general and technical training in this country, but because they are at present only at the outset of their mission.

AT the half-yearly general meeting of the Scottish Meteorological Society held in Edinburgh on Wednesday, papers were read by Mr. Clement L. Wragge, on the observations made by him on Ben Nevis last summer; by Mr. Buchan, on the results of the Ben Nevis observations, with more special reference to the Weather Forecasts; and by Dr. Arthur Mitchell, on the Smallpox Epidemic in London during 1881. A gold medal from the Council of the Society was presented to Mr. Wragge in recognition of his valuable services in connection with the Ben Nevis observations.

ON Wednesday evening, at 7 o'clock, Professors Abel and Roscoe, on behalf of the Chemical Society, the Society of Chemical Industry, and the Institute of Chemistry, received a large number of distinguished guests in the Crystal Palace, where refreshments were provided. Fifteen hundred invitations were issued and accepted, not merely within the limits of the United Kingdom, but in continental countries, and several eminent chemists from France and Germany came over expressly to join the gathering. The Crystal Palace was chosen as the meeting place because of the International Electrical Exhibition now being held there; and the party dispersed themselves about the various exhibits. It was a gala night at the Palace, and the different electric lighting systems were shown at their best. The magnificent display by Edison in the Concert Room and Entertainment Hall elicited much admiration; so also did the fine candelabrum of 96 Maxim lights, executed in cut-glass by Messrs. Defries and Sons, and exhibited by the Electric Power and Generator Company. These lights are fed by a Maxim dynamo-electric machine capable of feeding 100 Maxim lamps of 30 candle-power each. The incandescent lamps of Mr. Lane-Fox, exhibited by the Anglo-American Brush Electric Company, the Bright system exhibited by the British Electric Light Company, and the Swan system were visited in turn, as also were the suite of apartments in the northern gallery lit by Edison's lamps. The visitors scattered about the various stalls, and a special train carried most of them away to town at 9.30 p.m.

MR. CLEMENT L. WRAGGE sends us the following communication:—The observations on Ben Nevis will probably be continued during the coming summer, and with this view I hope soon to revisit Lochaber, but it is yet too early to refer to definite arrangements. The museum I have placed in Stafford, the county town of my family, is lent to the town and county for twenty-one years, thereafter to become a gift if certain conditions have been complied with. The meteorological station there will probably be started next month. I regret to say that my negotiations for a central high level observatory on the Peak have fallen through. The owner of one portion of the land, annoyed by the operations of the Ordnance surveyors, has turned a deaf ear to my appeal, being determined to prevent any further trespass; and the agent for another could only give me permission under conditions, one of which was that it would rest with me to compensate the tenants for disturbance of game. Moreover, the Meteorological Office could not see its way to provide an observer, on the ground of indirect telegraphic communication. The instruments were all in readiness; and the barometer, a fine "Board of Trade," reading to 23.6, made to my order by Messrs. Adie and Wedderburn of this city in anticipation of no difficulty, is at present hanging practically idle. A series of high level meteorological stations in direct connection with Ben Nevis, would, I consider, be of the utmost value; and until we get them we cannot hope to perfect our system of weather forecasting.

THE Congress relating to the protection of cables is not the only one which will be held in Paris next April. A circular has been sent to the different powers asking them to appoint scientific delegates to determine the exact length of the

mercury column, which is to be considered as equal to an ohm; secondly, to select a new standard for comparing the photometric power of several lights; thirdly, to establish a plan of common co-operation for studying atmospheric electricity as proposed by Sir William Thomson, and adopted unanimously by the Congress of Electricians.

THE French Minister of Public Works having sent a delegate to report on the Smoke Abatement Exhibition, it is supposed that M. Cochery will be obliged to reconsider his refusal to send delegates to the Electrical Exhibition at the Crystal Palace which extraordinary step has caused great disappointment in various quarters.

IN the *État de l'Algérie*, published by the new governor-general, we see that the Algerian system of meteorological observation extends from Mogador to Tripoli. The number of stations is forty-eight, but only thirty-six send daily reports by telegrams. The warnings of the Algerian meteorological office are telegraphed to twelve commercial seaports on the coast of Algeria. The most southern station is Wargla, in the desert where Laghouat, Tuggurt, and some others have been located. This office is directed by the staff of military engineers independently of Paris.

A FEW months ago the Rev. W. S. Green, of Carrigaline, Co. Cork, started on a mountaineering expedition to New Zealand. Mr. Green was accompanied by two Swiss guides, and a telegram just received announces that the party has succeeded in making the ascent of Mount Cook.

A BILL for compelling railway companies to use continuous brakes has passed the second reading in the House of Lords.

SIR JOHN LUBBOCK, as president of the Linnean Society, will give a *soirée* on Tuesday evening at the Society's Rooms, Burlington House.

THE Berlin Society of Commercial Geography, which has been in existence for about two years, has already developed a wonderful amount of activity. It publishes two organs, one weekly, under the title of *Export*, the other *Nachrichte für Welthandel und Volkswirtschaft* at longer intervals. In both organs, while the development of German commerce is mainly kept in view, that object is sought to be promoted by obtaining at first hand a scientific knowledge of the products and peoples of the various countries of the world. The papers and notes on these points are all of great interest, and form important contributions to various aspects of geographical science. In this respect they form a marked contrast to the publications of similar societies in other countries, and we see one more evidence of the thoroughness of education in Germany, and of the utility of science in all departments of activity. This Society, there is little doubt, will be of great service to the development of German commerce; it seems to have competent correspondents in all parts of the world.

EARTHQUAKES are reported from the following localities:—On February 27, at 9.15 a.m., a number of weak shocks were noticed at Roveredo, lasting about six to seven seconds. They were also felt at Olivone, and far more violently at Bellinzona. On March 4, at 9.5 p.m., a violent shock, accompanied by subterranean noise, was felt at St. Johann in the Wieselburg Comitatus (Hungary). The shock lasted two seconds, and proceeded in the direction from south to north. An undulatory and moderately violent earthquake occurred on March 11, at 2.54 a.m. at Metkovich, on the road to Mostar (the scene of the present revolutionary disturbances). Its direction was from north to south. The volcanic phenomena which have lately alarmed the inhabitants of the Ætolian coast have not yet ceased. There is now no doubt that a submarine crater has been formed. A short

time ago a tolerably violent shock of earthquake was felt, accompanied by subterranean roaring and hissing. At the same time a strong odour of sulphuretted hydrogen rose from the sea. A thick layer of a gelatine-like mineral matter covers the surface of the sea to a great distance, and floats upon it like a layer of oil. It is not disturbed by the sea being in a high state of agitation, but has, on the contrary, a tranquillising effect upon the motion of the waves.

A TELEGRAM received at Constantinople, March 21, announces that three strong shocks of earthquake were felt on that day on the island of Chios. The population had taken refuge in tents. The temperature is excessively high.

FURTHER intelligence received from Panama states that during the recent earthquake in Costa Rica there was no loss of life whatever, and the damage to property was unimportant.

It is related by MM. Macé de Lepinay and Nicati (*Four. de Phys.*), that after a mountain excursion, and five hours among snow-fields, one of them found all artificial lights in town (candles and oil lamps) to appear distinctly green; the effect lasting from 7.30 to 11 p.m. This case of temporary daltonism for red is attributed to the fatigue of the retina for red persisting much longer than that for other colours. The authors describe a simple experiment by which this persistence may be verified. Three coloured glasses are taken, red, green, and blue, which, with average illumination, all bring the visual acuteness to about the same value. Having nearly shut the shutters and placed himself a few yards from a white board with printed letters of different sizes on it, the observer finds that, at the first, he can, with the blue glass, make out pretty distinctly the letters of medium size; whereas, with the red glass, the visual acuteness is so much reduced, that he cannot even distinguish the board. But if the darkness be continued, he observes that, whereas the visual acuteness does not sensibly increase with the blue glass, he is presently able, with the red, to make out, first the board, and then the largest letters. The visual acuteness in the latter case increases, at first quickly, then more slowly, for half an hour, when it becomes nearly stationary. Green glass gives results intermediate between the others. It is important to remark, that in all cases, even after an hour and a half, the visual acuteness with the red glass remains considerably less than with the blue.

A SMALL herbarium of plants, some thirty-five centuries old, must be an object of considerable interest. Such an one has recently been formed by Dr. Schweinfurth, from garlands found on the breasts of mummies discovered last year at Deir el Bahari, by MM. Brugsch and Maspero. Two garlands on the body of the King Aames I., consisted (according to a letter of the Doctor's published in *Archives des Sciences*) of leaves of Egyptian willow (*Salix salsaf*), folded twice, and sewed side by side along a branch of the date-palm, so forming clasps for separate flowers inserted in the folds. The flowers were those of *Acacia Nilotica*, of *Nymphaea cerulea*, with isolated petals, of *Alcea ficifolia*, and of a *Delphinium*, believed to be *orientale*. The garlands of the other kings contained flowers of *Carthamus tinctorius*, and the folded leaves were those of *Mimusops Kummel*. Leaves of the common water-melon (*Cucumis citrullus*) were also found on the body of Neb-Seni, a high priest of the twentieth dynasty. Dr. Schweinfurth managed to preserve many of the leaves and flowers, by moistening them, then putting in alcohol, then spreading out and drying. A remarkable thing is the preservation of colour of the chlorophyll violet in *Delphinium*, green in the water-melon leaves. All the species named are still found in the East; and they afford examples of both spontaneous and cultivated plants, continuing for many centuries without variation.

WE have received part 4 of vol. ii. of "Appalachia," the organ of the "Appalachian Mountain Club." This Club is attempting to do in the United States what the Alpine Clubs are doing in Europe, and during the few years of its existence, has accomplished much in stimulating a love of science and mountain beauty in the community, also in making the mountains more accessible, and the more interesting parts better known. The part before us contains several interesting papers, mainly on the picturesque and historical aspects of the Appalachians, but includes a paper giving useful elementary instruction in geodesy. The Club includes many names well known in science in its list, and from the present and previous numbers of its journal, we judge that it is doing good work.

IN some experiments with flashing signals by the electric light, conducted on the evening of the 8th, at Woolwich, the clouds were lit up at intervals as far as the zenith over Chislehurst Common, a distance of between five and six miles. The sky was everywhere overcast; but the clouds were not hanging low at the time.

AT the Paris Academy of Sciences, on Monday, M. Blavier, mining engineer, called attention to the disappearance of the sardine from the coast of Brittany, where it used to bring in the fishermen 15,000,000 fr. a year. He attributed this to a change in the direction of the Gulf Stream, which also accounted for the mild winter and early spring. On the suggestion of M. Faye, the question was referred to a committee composed of MM. Faye, Janssen, Daubrée, and Admiral Jurien.

THE grand *soirée* given by Admiral Mouchez at the Observatory of Paris, on Monday, March 13, was very successful. Electricity formed a prominent feature of the entertainment. The illumination of the Salon du Nord by Faure accumulators lasted from 10 p.m. till 7 in the morning without the slightest interruption. Twenty-five Swan lamps were fed by a weight of 2500 kilograms in the accumulators. On the following day at 6 o'clock an experiment was made before Admiral Mouchez to show that about half of the electricity contained in the apparatus had not been used. The total force so accumulated is valued at 40 horse-power, which agrees with the determination given by Sir William Thomson and other experimenters.

THE Vienna apiculturists will hold an International Exhibition of live bees, honey, wax, hives, and all other objects relating to bee-culture, on April 8-15 next. Most European as well as Trans-oceanic countries will be represented. This is the first exhibition of the kind in Vienna.

NEAR St. Etienne (France) a new geyser has been discovered. At a depth of 1500 metres a vein of hot water was tapped, and the result is an intermittent fountain which sends its water to a height of 26 metres. The geyser ejects carbonic acid as well as hot water.

AT the monthly meeting of the Council of the Royal Historical Society, held March 17, Lord Aberdare in the chair, Mr. P. Edward Dove, of Lincoln's Inn, was unanimously elected Secretary to the Society.

THE Emperor of Russia has allotted to the St. Petersburg Geographical Society a sum of 20,000 roubles as a subsidy towards the erection of a second Russian polar station in Nova Zembla. It is expected that Lieut. Andrieff will be appointed chief of this new station.

ACCORDING to the *London and China Telegraph* a railway has been constructed in connection with the Kaiping collieries in North China, and permission to run a locomotive has been granted by the authorities. Six miles of line have already been laid down. The locomotive was constructed on the spot by native workmen, and is said to be very creditably done. This

is the first railway ever constructed on Chinese soil for the Chinese themselves, and with the consent of the authorities. The abortive Shanghai-Woosung line was built by foreign engineers with foreign capital, against the wish of the Chinese Government.

THE additions to the Zoological Society's Gardens during the past week include two Martinique Water-hens (*Porphyrion martinicus*), captured at sea, presented by Lieut. A. H. Oliver, R.N.; a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mrs. Hill; a Blotched Gevet (*Genetta tigrina*) from South Africa, deposited; two Ruffs (*Machetes pugnax*), two Redshanks (*Totanus calidris*), British, purchased; two Common Badgers (*Meles taxus*), born in the Gardens.

## OUR ASTRONOMICAL COLUMN

THE APPROACHING TRANSIT OF VENUS.—In reply to a question in the House of Commons on Monday, the Secretary of the Treasury stated that in connection with the proposed observation of this phenomenon, 275*l.* had already been voted on a supplementary estimate for 1881-2, 14,680*l.* is provided in the Civil Service estimates for the coming financial year, and it is anticipated that about 1000*l.* will be required in the year 1883-4, for the reduction of the observations. A ship of war would convey a party to and from Madagascar. We believe it is proposed to occupy a station on the west coast of this island, the meteorological conditions being more favourable than on the eastern coast, though there is understood to be a disadvantage (any inconvenience from which the presence of a vessel of war may obviate), that the west coast is not directly under the control of the central government of the island.

It is known that the necessary arrangements are being made, with the assistance of a committee of the Royal Society, who have named Mr. E. J. Stone, the Radcliffe observer, to be directing astronomer. If success attends the British expeditions, much will be due to the energy and discrimination which Mr. Stone is exercising in that rather laborious position, as shown by his report to the International Committee on the Transit, held at Paris last October. We understand it is proposed to drill the intending observers, as far as can be done, in preparation for the special features to be noted, under the immediate direction of Mr. Stone, at the Radcliffe Observatory, Oxford.

THE TOPOGRAPHY OF THE PLANET MARS.—Prof. Schiaparelli has published a second important memoir, entitled "Osservazioni Astronomiche e Fisiche sull' Asse di Rotazione e sulla Topografia del Pianeta Marte . . ." (*Reale Accademia dei Lincei*, anno cclxxviii. 1880-81), to which we shall refer more particularly in an early column. By combining his observations at the opposition 1879-80 with those made at the favourable opposition of 1877, he finds the position of the equator of Mars referred to the earth's equator as follows:—Ascending node (1880), in 48° 7' 8", inclination 36° 22' 9"—figures differing little from those provisionally adopted by Mr. Marth.

CERASKI'S VARIABLE STAR, U CEPHEI.—Mr. G. Knott, writing from Cuckfield on March 20, remarks that a conveniently observable series of minima of Ceraski's variable, U Cephei (DM. 81°, 25), has come round again. He obtained a good set of observations on March 18, from which the date of minimum (middle of phase) comes out March 18d. 12h. 21m. G.M.T., or about 21m. later than the time deduced from carrying on Schmidt's ephemeris (*Astron. Nach.* 2382), using his period, 2.4927703d. The magnitude of the star at minimum was 9.5, which, Mr. Knott observes, confirms an impression that had presented itself to him from an examination of the light-curve, that at alternate minima the star touches a somewhat lower magnitude as a rule. The difference is not great, about two or three tenths of a magnitude, but he believes it has a real existence: an interesting result, if it should be confirmed.

Prof. Pickering, in his "Photometric Measures of the Variable Stars  $\beta$  Persei and D.M. 81°, 25," has the remark: "The star D.M. 81°, 18 is either variable, or its light in grades is erroneously given by Glasenapp." Mr. Knott finds that the star is certainly variable to the extent of about six-tenths of a magnitude, but is not yet able to say anything as to its period. It is a decidedly ruddy-coloured star. Place for 1855°0 in R.A. oh. 38m. 28s.,